

**CLAIMS:**

1. A lithographic projection apparatus comprising:
  - an illumination system for supplying a projection beam of radiation;
  - a first object table for holding patterning means capable of patterning the projection beam according to a desired pattern;
  - a second object table for holding a substrate having a surface to be exposed, such that, when held on the table, the said surface lies in a reference plane;
  - a projection system for imaging the patterned beam onto a target portion of the substrate; and
  - a positioning system for moving said second object table between an exposure position, at which said projection system can image said patterned beam onto said substrate, and a measurement position; characterized by:
    - a calibration system for measuring lateral displacements of a reference point in a plane of said second object table as a function of tilt, at said measurement position, wherein said calibration system comprises:
      - a diffraction grating mounted to said second object table;
      - illuminating means for generating a measurement beam of radiation and directing it to be incident on said diffraction grating so as to be diffracted thereby; and
      - a detector for detecting the position of said diffraction grating.